

Applicant:
For:

Warren
Foldable Member

- 1 1. A foldable member comprising:
- 2 at least a first tube;
- 3 at least one predetermined hinge area along the length of the
- 4 first tube; and
- 5 opposing sets of elongated slots in the tube at the hinge area
- 6 thereof forming separated longitudinal strips of tube
- 7 material between the slots which fold when subjected to localized
- 8 buckling forces,
- 9 each slot of each set of elongated slots separated
- 10 longitudinally along the length of the tube from each adjacent slot by
- 11 a bridge element of tube material.
- 1 2. The foldable member of claim 1 in which the opposing sets of elongated
- 2 slots are diametrically opposed from each other on the tube.
- 1 3. The foldable member of claim 1 in which each slot in each set of slots is
- 2 diametrically opposed from a slot in the opposing set of slots.
- 1 4. The foldable member of claim 1 in which there are two sets of slots.
- 1 5. The foldable member of claim 4 in which there are two slots in each set of

2 slots.

1 6. The foldable member of claim 1 in which there are two sets of slots and
2 two slots in each set.

1 7. The foldable member of claim 1 in which there is a stress relieving
2 member attached to each bridge element on the inside of the tube.

1 8. The foldable member of claim 1 in which the tube is made of a plastic
2 material.

1 9. The foldable member of claim 1 in which the tube is made of a composite
2 material.

1 10. The foldable member of claim 9 in which the composite material includes
2 a triaxial braid of fibers in a resin matrix.

1 11. The foldable member of claim 1 in which there are a plurality of hinge
2 areas spaced from each other along the length of the tube, each hinge area including
3 opposing sets of elongated slots.

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1 12. The foldable member of claim 1 further including an electrical conductor
2 disposed in the tube.

1 13. The foldable member of claim 1 further including at least one transducer
2 device located proximate a hinge area for controlling the folding of the longitudinal strips
3 of tube material.

1 14. The foldable member of claim 1 further including slot reinforcing
2 members disposed in the slots.

1 15. The foldable member of claim 1 in which the elongated slots are triangle
2 shaped.

1 16. The foldable member of claim 1 in which the elongated slots are diamond
2 shaped.

1 17. The foldable member of claim 1 in which there are four slots in each set of
2 slots, each slot of a pair of the four slots opposing another slot.

1 18. The foldable member of claim 1 in which each slot has a reduced diameter
2 portion.

1 19. The foldable member of claim 1 further including a second tube disposed

2 inside the first tube.

1 20. The foldable member of claim 19 in which the second tube includes
2 opposing sets of elongated slots at the hinge area thereof.

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- 1 21. A collapsible structure comprising:
- 2 a plurality of joined members;
- 3 a selected number of said members each including:
- 4 a tube;
- 5 at least one predetermined hinge area along the
- 6 length of the tube; and
- 7 opposing sets of elongated slots in the tube at the hinge area
- 8 thereof forming separated longitudinal strips of tube material
- 9 between the slots which fold when subjected to localized buckling
- 10 forces,
- 11 each slot of each set of elongated slots separated
- 12 longitudinally along the length of the tube from each adjacent slot by
- 13 a bridge element of tube material.

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1 ¹ ~~22.~~ A foldable member comprising:
2 at least a first tube made of layers of material;
3 at least one predetermined hinge area along the length of the first
4 tube; and
5 a plurality of opposing elongated slots in the tube through the
6 layers of material forming separated longitudinal strips of layers of tube
7 material between the slots which fold when subjected to localized
8 buckling forces.

1 ² ~~23.~~ The foldable member of claim ~~22~~¹ in which first tube includes a sheet of
2 plastic material wrapped around itself several times forming the layers of tube material.

1 ³ ~~24.~~ The foldable member of claim ~~23~~² further including an adhesive securing
2 the layers of plastic material to each other at selected locations along the length of the
3 tube.

1 ⁴ ~~25.~~ The foldable member of claim ~~24~~³ in which the adhesive is a tape.

1 ⁵ ~~26.~~ The foldable member of claim ~~24~~³ in which the sheet of plastic material
2 comes from a roll of plastic stock material and has a round memory.

1 ⁶ ~~27.~~ The foldable member of claim ~~22~~¹ in which the layers of material are
2 laminated to each other except at the predetermined hinge area.